

REMARKS

In the Office Action, the Examiner rejected claims 1-5 and 7-11, 13-35, 37-39, 42-44, 46, 48, 50-52 and 53-54 under 35 USC § 102 and claim 1-2, 6-11, 13-18, 36, 41, 45, 47, 49 under 35 USC § 103. These rejections are fully traversed below.

Claims 1, 19 and 50 have been amended. In particular, the limitations of claim 38 have been added to claim 1 and the limitations of claim 22 have been added to claim 19 and the limitations of claim 51 have been added to claim 50. Claims 20-22, 38, 41 and 50 have been cancelled. Thus, claims 1-11, 13-19, 23-37, 39-40, 42-49 and 51-54 are pending in the application. Reconsideration of the application is respectfully requested based on the following remarks.

Claim Objections

Claim 20 has been cancelled.

ISSUES UNDER 35 USC 102

Claims 1-5, 7-11, 13-18 and 38-39 have been rejected under 35 U.S.C. §102(e) as being anticipated by *Li et al.*, U.S. Patent 6,070,551.

In contrast to *Li*, claim 1 (and its dependents) specifically requires, "...said gas flow system comprising at least one gas inlet for receiving said input gas that is to be delivered into said plasma processing chamber and at least first and second gas outlets that are each capable of delivering said input gas to said plasma processing system, at least a portion of said input gas being delivered to said plasma processing chamber via said first and second outlets..." While *Li* may disclose center nozzles 56 and nozzles 34/34a, *Li* does not teach or suggest receiving an input gas through a gas inlet and delivering a portion of the input gas to the plasma processing chamber via first and second outlets. In *Li*, an individual gas source provides a gas directly to individual nozzles 56, 34 or nozzle 34a. In particular, first gas source 35 provides gas to nozzle 34, second gas source 35a provides gas to nozzle 34a and third gas source 58 provides gas to center nozzle 56. None of these gases are delivered into separate first and second nozzles. That

is, each gas source has its own dedicated nozzle. They don't supply gas to any other nozzle. Accordingly, the rejection is unsupported by the art and should be withdrawn.

The rejections to the dependent claims should also be withdrawn or at least the same reasons as above since these claims depend either directly or indirectly from the independent claim. Even in lieu of this, it should be noted that the dependent claims require additional features that are not taught in the cited reference.

Claims 19-20, 23-25, 28-30, 32-34, 42-44 and 53-54 have been rejected under 35 U.S.C. §102(b) as being anticipated by *Collins et al.*, U.S. Patent 6,024,826.

In contrast to *Collins*, claim 19 (and its dependents) specifically requires, "...said at least two different regions including a top central region, a lower peripheral region, and an upper peripheral region." While *Collins* may disclose center gas feed 164a, radial gas feed 164b and base axial gas feed 164c, *Collins* does not teach or suggest multiple peripheral gas feeds as in claim 19. Accordingly, the rejection is unsupported by the art and should be withdrawn.

The rejections to the dependent claims should also be withdrawn or at least the same reasons as above since these claims depend either directly or indirectly from the independent claim. Even in lieu of this, it should be noted that the dependent claims require additional features that are not taught in the cited reference.

Claims 19-35, 37, 42-44, 46, 48 and 53-54 have been rejected under 35 U.S.C. §102(e) as being anticipated by *Murugesh et al.*, U.S. Patent 6,228,781.

In contrast to *Murugesh*, claim 19 (and its dependents) specifically requires, "...said at least two different regions including a top central region, a lower peripheral region, and an upper peripheral region," and claim 37 (and its dependents) specifically requires, "...said gas flow system controlling the release of input gas, associated with forming a plasma, into a first, a second and a third region within said plasma processing chamber, said first region being a top central region located at the top surface of said plasma processing chamber, said second region being an upper peripheral region located on an upper surface of said plasma processing chamber proximate said upper end of said plasma processing chamber, said third region being a lower peripheral region located proximate said lower end of said plasma processing chamber." While

Murugesh may disclose a gas delivery system 33 that provides gases to a chamber in locations of a gas ring 37 and a gas nozzle 45, *Murugesh* does not teach or suggest providing gases from a third location as required by claim 37. In *Muregesh*, gases are introduced into chamber 13 through gas ring 37 and a top nozzle 45 (see generally, Col. 6, lines 35-41). Accordingly, the rejection is unsupported by the art and should be withdrawn.

The rejections to the dependent claims should also be withdrawn or at least the same reasons as above since these claims depend either directly or indirectly from the independent claim. Even in lieu of this, it should be noted that the dependent claims require additional features that are not taught in the cited reference.

By way of example, claim 54 specifically requires, "...said peripheral region being located closer to said top surface than said substrate when said substrate is disposed inside said plasma processing chamber for processing..." In *Murugesh*, gas ring 37 is located closer to substrate 17 than the top surface of chamber 13 (see Fig. 1A). Accordingly, the rejection is unsupported by the art and should be withdrawn.

Claims 50-52 have been rejected under 35 U.S.C. §102(b) as being anticipated by *Li et al.*, U.S. Patent 6,009,830.

In contrast to *Li*, claim 50 (and its dependents) specifically requires, "...a gas source capable of supplying an input gas formed by a mixture of gases..." While *Li* may disclose top gas feed 38 and bottom gas feed 40 as well as sources 64 and 66, *Li* does not teach or suggest supplying mixed gases. In *Li*, the sources only supply a distinct gas. Source 64 supplies C₄F₈ and source 66 supplies Ar. Accordingly, the rejection is unsupported by the art and should be withdrawn.

The rejections to the dependent claims should also be withdrawn or at least the same reasons as above since these claims depend either directly or indirectly from the independent claim. Even in lieu of this, it should be noted that the dependent claims require additional features that are not taught in the cited reference.

ISSUES UNDER 35 USC 103

Claim 6 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Li* (551) in view of *Wing* et al., U.S. patent 6,277,235.

Claims 6, 36 and 49 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Murugesh* et al . U.S. patent 6,228,781 , and further in view of *Wing*.

Claim 36 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Collins* in view of *Wing*.

In contrast to all these references, claim 6 specifically requires, "...wherein the input gas is released through the chuck." *Li*, *Murugesh* and *Collins* are all silent to introducing a gas through a chuck (as indicated by the Examiner in the outstanding office action). And while *Wing* may disclose aperture 8 centrally located in the surface of the chuck 106, *Wing* does not teach or suggest flowing a source gas suitable for use to etch the substrate in the processing chamber 100 through the aperture 108. As further required in claim 1 from which claim 6 depends, "said input gas being a source gas suitable for use to etch said substrate in said plasma processing chamber." In *Wing*, gas such as He is supplied to the backside of the substrate from gas source 118 and aperture 108 to improve heat transfer and control substrate backside deposition (see Col. 3, lines 49-55). Accordingly, the rejection is unsupported by the art and should be withdrawn.

Similar arguments can be made for claims 36 and 49.

Claim 41 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Li* (551) in view of *Li* et al., U.S. patent 6,009,830.

Claim 41 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Murugesh* in view of *Li* (830).

Claim 41 has been cancelled.

Claims 45 and 47 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Muruges* in view of *Ueda* et al., U.S. Patent 5,810,932 and further in view of *Kadomura*, U.S. Patent 6,096,160.

Claim 45 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Collins* in view of *Ueda* and *Kadomura*.

The rejections to claims 45 and 47 should be withdrawn for at least the same reasons as above. That is, *Ueda* and *Kadomura* do not overcome the deficiencies of *Muruges* or *Kadomura*. None of these references teaches or suggests the features described above with regards to claims 19 and 37 from which claims 45 and 47 respectively depend.

Claims 1-2, 7-11 and 13-18 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Muruges*.

In contrast to *Muruges*, claim 1 (and its dependents) specifically requires, "...said input gas being mixed before passing through said first and second gas outlets ..." While *Muruges* may disclose gas sources 34, gas flow controllers 35, gas lines 38 and nozzles 45 and 38/40 , *Muruges* does not teach or suggest mixing gases before passing the gases through any of these components. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Double Patenting

These claims have been cancelled.

SUMMARY

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP

A handwritten signature in black ink, appearing to read "Hoellwarth", with a stylized flourish at the end.

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